

JANUARY 10, 2005

SOUVENIR



The Linear Accelerator

Bangalore Institute of Oncology



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The Linear Accelerator

**BIO
COMMEMORATES
15 YEARS
OF DEDICATED
PUBLIC SERVICE
IN THE FIELD OF
ONCOLOGY**



**BIO
FAMILY
ALBUM**



OUR TEAM OF ONCOLOGISTS



OUR TEAM OF DOCTORS & NURSES



OUR HOUSEKEEPING AND MAINTENANCE TEAM



OUR
RECEPTION
&
ADMIN
TEAM





OUR LINAC TEAM



OUR LAB TEAM



OUR NUCLEAR MEDICINE TEAM



OUR O T TEAM



... TOGETHER WE MAKE THINGS BETTER



समयम नयन

राष्ट्रपति के प्रेस सचिव

Press Secretary to the President



राष्ट्रपति सचिवालय

राष्ट्रपति भवन

नई दिल्ली - 110004

President's Secretariat

Rashtrapati Bhavan

New Delhi - 110004

MESSAGE

The President of India, Dr. A.P.J. Abdul Kalam, is happy to know that the Bangalore Institute of Oncology is inaugurating the State-of-the-Art Linear Accelerator and also bringing out a Souvenir on the occasion.

The President extends his warm greetings and felicitations to all those associated with the Institute and wishes the inauguration ceremony all success.

S. K. Khan

PRESS SECRETARY TO THE PRESIDENT



ಕರ್ನಾಟಕ ರಾಜ್ಯಪಾಲರ ಸಚಿವಾಲಯ
KARNATAKA GOVERNOR'S SECRETARIAT

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ರಾಜ ಭವನ, ಬೆಂಗಳೂರು
RAJ BHAVAN, BANGALORE
PIN : 560 001

December 20, 2004

MESSAGE

His Excellency the Governor of Karnataka is pleased to find that Bangalore Institute of Oncology is bringing out a souvenir on the occasion of introducing state-of-the-art Linear Accelerator used in the treatment of cancer.

The Governor is appreciative of the efforts being made by the Institute to provide treatment to cancer patients without discrimination. The latest treatment facilities it has in place, services of nationally and internationally acclaimed experts in the field it can avail of and a time-tested service record together elevate it to the level of a super speciality Institute. The Governor hopes that the Institute will progress from strength to strength in the years to come.

His Excellency sends his best wishes for the success of the endeavour.

(K.V. Jagannatha)
Personal Assistant to Governor



डा. आर. चिदम्बरम्
भारत सरकार के प्रमुख वैज्ञानिक सलाहकार
एवम्

डॉ. ए. इ. होमी भाभा प्रोफेसर

Dr. R. Chidambaram

Principal Scientific Adviser to Govt. of India

&

DAE - Homi Bhabha Professor



भारत सरकार

Government of India

भाभा परमाणु अनुसंधान केंद्र

BHABHA ATOMIC RESEARCH CENTRE

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December 27, 2004

MESSAGE

I am very happy to learn that the Bangalore Institute of Oncology, a leading cancer treatment centre in the country is commissioning a High Energy Linear Accelerator for radiation therapy with state-of-the-art accessories. Cancer incidence is growing in India, due mainly to the increase in life expectancy, and Radiation Oncology is, today, one of the most important modalities for the treatment of different types of cancers. Unprecedented technological developments have taken place in the field during the last 20 years and highly sophisticated techniques like stereotactic radiosurgery/radiotherapy, 3-D Conformal and Intensity Modulated Radiation delivery have also come into vogue. These developments have led to precise and accurate radiation delivery to achieve a higher degree of cure of various types of cancers and have also reduced morbidity.

I compliment the Institute for this acquisition and wish it and its dedicated doctors and consultants all success in their noble mission.

R. Chidambaram
(R. Chidambaram)

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C A N C E R C A R E

(REGISTERED UNDER KARNATAKA SOCIETIES ACT
CERTIFICATE No. 480/93-94)

President: Dr. Ms. Gladys Sumithra
Tel. No.: 22220586
Secretary: Mrs. Mary Lewis
Tel. No.: 25578470
Treasurer: J.C. Karkada
Tel. No.: 22212740

C/o Council of Catholic Women
of India
21, Museum Road
Bangalore 560 025

December 8, 2004

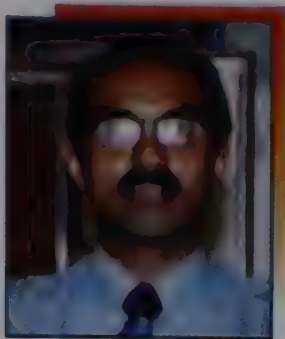
Bangalore Institute of Oncology and Cancercare Relationship in an Endeavor

I have the pleasure of writing these few lines to capture the blessings received from the relationship established in the past three years between the Bangalore Institute of Oncology and Cancercare. Initial step in our relationship was the encouraging and enlightening talk on cancer given by Dr. Ajai Kumar, Chairman, BIO to the senior citizens at Richmond Town Methodist Church. The talk really dispelled the imaginary notions and the fears of the disease and helped the senior citizens to have an understanding in the right perspective. Since then, Cancercare has received positive response to the requests for awareness talks and conduct of cancer detection camps. Cancercare has given some financial support to the needy patients of BIO. Cancercare members had the privilege of understanding the disease from the doctors who shared their knowledge and experience at the Annual General Body meeting in 2003. This year too, one of the staff and a son of the patient from BIO financially helped by Cancercare addressed the gathering, expressing appreciation to our relationship. It came out clearly that the little we do can have more benefits than one expects, directly as well as indirectly, specially on the family.

We also appreciate the time Dr. Ajai Kumar and his colleagues give us in sharing our concerns and the new initiatives the two organizations can take in the coming years. We hope that the relationship between the BIO and Cancercare will mean greater blessings to the suffering in particular and to the population at large through prevention and early detection. With best wishes to all at the Bangalore Institute of Oncology in your service to the society.

G. Sumithra
Dr. Ms. Gladys Sumithra
President

VISION OF B.I.O.



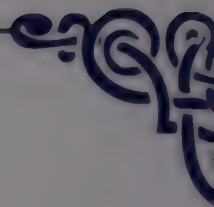
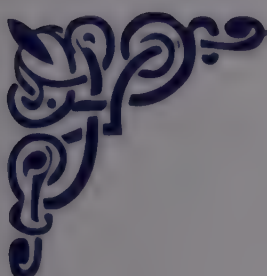
Cancer care in India was undergoing major transformation, from providing palliative care to terminally ill, to offering a more definitive treatment. To keep pace with this changing trend, Bangalore Institute of Oncology was established in 1989. The aim of the institution is to provide dedicated and comprehensive care in all aspects of oncology beginning with dissemination of information regarding prevention of cancer, early diagnosis and cure, to palliative care of the terminally ill patients.

Starting as a 30 bedded hospital with 5 consultants, BIO has now become a 120 bedded hospital with more than 30 consultants, and 162 dedicated staff.

With fully equipped OT, ICU, a separate post operative ward, and with the help of maxillo facial dental and plastic surgeons, complicated and curative surgeries are done with ease. Nearly 1600 major operations are performed every year. The medical oncology department with the leukemia unit adds to the quality treatment. Our radiation unit is equipped with the state of the art Linear Accelerator with multileaf collimators to deliver routine radiation or highly precise IMRT & 3D conformal therapy.

The LINAC is housed in a new aesthetic building adjacent to BIO and is equipped with the CT Simulator, Treatment Planning System, Local Area Network and Therapy Information System putting BIO at par with the best international institutes of oncology.

BIO offers treatment to all the people irrespective of their economic & social status. The patients are not only from Karnataka, but also from the neighbouring states of Andhra Pradesh and Tamil Nadu, thus providing public service in a private setting.



Incidence of cancers are influenced by different factors, a) increasing incidence of breast cancer in the urban areas, b) increased incidence of oral cancer in pan and Gutkha chewers, c) increased incidence of lung cancer in smokers. Our goal is to make an in depth study to identify the possible causes, where the cause is known, to identify measures of prevention and educate the people regarding need for early diagnosis and also to provide definite treatment in all stages of cancer.

When the patients are diagnosed with cancer, instead of creating a fear we take a positive approach with indepth staging workup including pathological staging and group discussion among consultants leading to individualised treatment recommendation and planning. Following this the patient and the family are fully appraised of the approach.

Over the years, BIO plans to become sub specialized in oncology care i.e. having separate speciality clinics for breast cancer, lymphoma, pediatrics cancer and thoracic cancer with necessary basic infrastructure and well trained, dedicated staff.

To conclude, I can say that BIO is a premier cancer institute, providing comprehensive international standard cancer care.

Dr. B.S. Ajaikumar,
Chairman



FROM THE DESK OF MANAGING DIRECTOR



Cancer is a common disease and accounts for morbidity and mortality in a significant section of the population. According to statistics from World Health Organization about 10 million people are diagnosed to have cancer world wide every year.

Given the present trend in the prevalence of smoking, consumption of tobacco products and adoption of unhealthy life styles, the incidence of cancer is expected to grow by 50% in the next 20 years to reach around 15 million by the year 2020. 6 million deaths every year or 12% of deaths world wide.

India has estimated 1.5 to 2 million cases of cancer, with 5 lakh new cases added each year. Annual deaths from cancer total around 3 lakh.

Unfortunately, our country grossly lacks facilities to treat such a large number of patients. With this in mind Bangalore Institute of Oncology was established in the year 1989 to provide comprehensive, total and quality care for patients with cancer.

At Bangalore Institute of Oncology quality care is provided by experienced and dedicated experts in various fields of cancer and Bangalore Institute of Oncology has one of the best facilities in the diagnosis and treatment in the field of oncology.

Since its inception, Bangalore Institute of Oncology has grown by leaps and bounds and today it has become a Landmark Hospital in Cancer Therapy. It is attracting patients, not only from Bangalore, but also from all corners of Karnataka State and also neighbouring states of Kerala, Tamil Nadu, Andhra Pradesh and Maharashtra.

We are growing and Bangalore Institute of Oncology as a premier institute in the field of oncology has ambitious plans for upgradation and expansion for the very near future and hopes to become a global player to provide cancer therapy of International Standards.

Dr. Ganesh Nayak
Managing Director & Vice Chairman



Cancer is so limited.....

It cannot cripple love

It cannot shatter hope

It cannot corrode faith

It cannot destroy peace

It cannot kill friendship

It cannot suppress memories

It cannot silence courage

It cannot invade the soul

It cannot steal eternal life

It cannot conquer the spirit

Courtesy Dr. Nalini Rao



BRIGHTER SIDE OF CANCER CARE

The general impression about Cancer and its outcome, among both the lay public and medical fraternity (excluding oncologists), is that it is an incurable, morbid & painful disease. The truth nevertheless is different.



The incidence of cancer is increasing, probably out of proportion with the growth in population. The result is that there are more number of cancer patients and it is presently the 2nd leading cause of death. However, the number of cancer patients being cured is also increasing. Currently about 50% of cancers, across all types & stages are being cured. In some cancers (larynx, cervix, childhood tumors) the cure rates approach 100% in early stages. So, while the public perceives the increasing number of patients, they remain blind to the greater number of cures.

The cause of this dramatic increase in cure rates is a result of all round improvement in all the sub-specialties of Oncology :

The advances in Pathology herald the era of Electron Microscopy, Immunohistochemistry and tumor markers. These have helped us stage diseases more specifically and to identify subsets which need to be treated differently.

There has been a technological boom in the field of Radiology and Imaging. We are in the era where high resolution CT scans, MRIs, Mammographies have become easily accessible and routine. The field of Nuclear Oncology has witnessed an equally dramatic growth. We are now able to have functional imaging of all organs of the body. These and the latest developments in imaging, namely the PET scans, are set to further revolutionize the treatment of cancer patients.

The growth in the treating specialities have been equally impressive:

In surgery we have reached the stage where we can successfully execute the biggest and most radical surgeries (with the help of development in anesthesia). Now the challenge is in achieving the same successful results with much smaller surgeries. There is a surge towards Organ Preserving Surgeries (Breast, Larynx etc.,). There is a re-emergence of Sentinel node biopsies. The complete focus is on Quality of Life & Organ Preservation.

The field of Medical Oncology has probably seen the maximum growth over the last few years. From being an add-on speciality with a few drugs, there are now hundreds of drugs. The spectrum of drugs is impressive ranging from broad spectrum drugs like Cisplatin & Adriamycin, to more specific drugs like Carboplatin & Epirubicin to even more specific drugs like the monoclonal bodies, Caleyx, Gleevac etc. In supporting these drugs are the substance like the growth factors, blood and blood products, enhanced venous access devices etc. To sum it up Medical Oncology has attained maturity! We are able to give targetted therapy to disease and where that is not possible we are trying to protect the normal issues.

Our center is comparable to any advanced radiation oncology center in the world which can offer 3-D treatment facility. Our next endeavour is to add the Intensity Modulated Radiation Therapy to further augment our existing facilities.

On the Brachytherapy front we are shortly adding HDR system to this venture. As the technology is progressing very fast in detecting early metastatic deposits and a residual tumor (viable) tissue, our institute is also aiming to add a positron emission tomography with a CT-Scan (PET / CT scan) to the armamentarium of our diagnostic facility.

Thus a center, which was started by the medical professionals, is getting stronger day-by-day bestowing the state of the art treatment in Radiation Oncology at the Bangalore Institute of Oncology. So far we have treated 10,000 patients in radiotherapy with satisfying results.

Dr. Ramesh S. Bilimagga MD (RT), DRM, DMRD, FICS, PGDMLE
Director and Consultant Radiation Oncologist



BREAST CONSERVATION THERAPY IN BREAST CANCER



Changing Trends

Breast cancer was thought to spread in an orderly fashion from the site of primary tumour to the axillary lymph nodes, and then via the blood stream to distant sites mandating radical mastectomy.

Over time it became apparent that distant metastasis develop in many women with breast cancer inspite of radical surgical procedures prompting a re-examination of our understanding of breast cancer biology. So, it was proposed that breast cancer is a systemic disease at presentation.

Evidence for breast conserving surgery :

The results of modern prospective randomized clinical trials comparing BCT and mastectomy have all shown equivalent survival between the two treatment approaches and an overview of all the trials has demonstrated comparable survival.

Local recurrence

From randomized studies :

BCT - 7-19% over 7 -18 years

Mastectomy - 4-14 %

After mastectomy most local failures occurs in the first three years, but in case of BCT there is a persistent risk of recurrence in the breast through 20 years of follow-up.

Whole breast irradiation is effective at eradicating multicentric breast carcinoma, but it does not prevent the subsequent development of new cancers.

The local recurrence after BCT can be salvaged by mastectomy, but the local recurrence after mastectomy has poor prognosis.

GUIDELINES FOR PATIENT SELECTION

Contraindications :

Absolute Contraindications :

- 2 or more primary tumours in separate quadrants.
- Diffuse malignant appearing microcalcification
- History of previous therapeutic irradiation to the breast region.
- Pregnancy
- Persistent positive margin after reasonable surgical attempts.

Relative Contraindications :

- Collagen vascular disease such patient tolerates radiation poorly.
- Multiple gross tumors in the same quadrant and indeterminate calcification
- In the presence of large tumour in a small breast in which an adequate resection results in poor cosmetic outcome. Few reports have been published with tumours larger than 5cms.

Pre-operative Evaluation :

- High quality bilateral mammography
- The site of palpable tumours marked with radio opaque marker.
- Magnification view of primary tumour site taken to assess the extent of any calcifications associated with primary tumour.
- Any other abnormalities should be evaluated with spot compression and magnification views.
- Extensive evaluation for metastatic disease in the asymptomatic patient are unwarranted.
- Bone scans reserved for patients with palpable nodes, raised alkaline phosphatase or bone pain.
- Imaging studies of liver and brain - indicated if symptoms are present.

Technique of lumpectomy :

- The incision should be placed in a skin line and be large enough to allow the specimen to be removed single piece.
- Upper half of breast - curvilinear incisions
- Inferior half - Radial incisions
- Thick skin flaps are raised to maintain a normal breast contour.
- The breast lump is excised with atleast 1cms surrounding breast tissue.
- Meticulous hemostasis achieved with electrocautery

- Reapproximation of lumpectomy cavity should be avoided.
- Drains are not employed since the dead space is allowed to fill with seroma, helping to maintain breast contours.

Specimen Management :

- The specimen should be removed as single piece.
- Two marking sutures are placed - a short in the superior margin & long in the lateral margin .
- The surface of the specimen is painted with ink to allow an assessment of the proximity of the tumour to the margin.
- The pathology report should include a statement regarding the presence or absence of tumour at the margins of resection, which margins are involved and the extent (gross, extensive microscopic, or single microscopic focus) of involvement of the margins.

Role of radiation after BCS :

- Six randomized trials have shown that the use of breast irradiation after BCS is associated with a large reduction in the rate of local recurrence.
- The available data from the randomized trials do not show a survival benefit, none of them have the statistical power to eliminate a small survival difference.
- Radiation is currently considered standard.

Dr. K.S. Gopinath M.S, FRCS
Director & Consultant - Surgical Oncologist,
and his Team
Dr. Mahesh B.
Dr. Krishna Reddy
Dr. Shivananda Swamy



ROLE OF SURGICAL PATHOLOGIST IN THE PRACTICE OF ONCOLOGY

We have come a long way since the time that Velpeau of clinical surgery at the Paris faculty, stated in his work of "Diseases of the breast" published in 1853 : "The intervention of the microscope is not at all necessary to decide whether such and such a tumour which has been removed, is or is not of cancerous nature *". (* from Ackerman's textbook on surgical pathology).



Cancer is not a single disease. There are numerous distinct varieties of tumours, each with a characteristic biology. Moreover, tumours have a course of development and progression. It is the task of the surgical pathologist to provide an accurate, specific, and sufficiently comprehensive diagnosis to enable the clinician to develop an optimal plan of treatment and, to the extent possible, estimate prognosis.

Surgical pathologists deal primarily with structure. Careful gross examination of excised tissue, with the naked eye, is followed by a more detailed examination of tissue sections in the compound light microscope. To do a good job, the pathologist must be informed about the clinical history, differential diagnosis, relevant laboratory results, gross tissue examination, and frozen section findings, if any, since they may individually or together influence the diagnosis. Specimens should be marked with clips, sutures, or ink to provide anatomic orientation, and these should be described in the pathology requisition.

The surgical pathology report

The surgical pathology report should be prompt, accurate and brief.

It should not only describe, thoroughly and concisely the relevant gross and microscopic features of a case but should also interpret their significance for the clinician. The findings should be presented in terms that are understandable to both the pathologist and the referring clinician. Synoptic reporting guidelines are available on websites (e.g. the Royal College of Pathologists and College of American Pathologists).

Failure to give reports promptly may delay therapeutic decisions (thus adding to the cost of medical care) and prolong anxiety in patients who are often already distraught.

Some important issues in "grossing" of specimen are : Size of lesion, status of excision margins and ALL lymph nodes, adequacy of tumor sections.

Pathologist also contributes to tumor staging (the commonly used TNM staging).

Frozen sections have many important uses - deciding whether a lesion is neoplastic and benign or malignant, looking for regional metastases which may decide further surgery; (e.g. mediastinal lymph node in lung carcinoma, peripancreatic lymph node in pancreatic carcinoma) and determining whether the resection margins are adequate following definitive cancer surgery.

However some tumour margins, such as those of soft tissues or breast, are best evaluated in permanent sections. It must be remembered that fat and skin cut poorly as frozen sections. Also bone cannot be sampled, but the marrow can be scooped out and frozen.

Cytology is used for both screening and diagnosing lesions that may represent cancer. Advantages include cost-effectiveness, rapid turnaround time, and a diagnosis that is positive, suspicious, atypical, or negative. A positive diagnosis indicates that the pathologist is sufficiently confident of the malignancy, that he/she is prepared to have the patient undergo definitive treatment based on that diagnosis alone. Occasionally, clinical and /or radiologic, evidence of malignancy is so strong that clinicians feel confident to implement definitive therapy with a suspicious diagnosis. That should be the decision of the responsible clinician. In the atypical or suspicious category, other diagnostic tests may be needed depending on the clinical situation. A negative cytology means that no abnormal cells were found in the sample examined. It is important for all to realize that this does not necessarily indicate absence of malignancy in the patient.

Immunohistochemistry has become an intrinsic part of surgical pathology reporting in many cases. It can help in : determination of primary in cases of metastasis from unknown origin, histogenesis of undifferentiated tumors/round cell tumors/soft tissue sarcomas, detection of antigens of potential prognostic and /or therapeutic significance (eg. Hormone receptors in breast cancers, CD117 in gastrointestinal stromal tumours) and subclassification of leukemias/lymphomas.

Pitfalls / limitations

Often tissue (biopsy/definite surgery) is divided and sent to different pathologists at the same time. This is unfair to the patient and the pathologists since the material received by each pathologist may not be representative. The ideal thing to do is send all material to one pathologist and then take as many second opinions as desired on the slides prepared.

Inadequate tissue sampling and artifacts induced by the procedure itself, can cause diagnostic problems. Benign findings do not exclude the possibility that a tumor or any other significant pathologic condition is present but was not included in the tissue / smears submitted for examination.

Difficult cases include : scanty tumor cells in an extensive inflammatory cell infiltrate (in stomach biopsies), healing ulcers resembling carcinomas or premalignant lesions atypical hyperplasia in breast versus in situ carcinoma.

Lack of objectivity in scoring/grading may result in non-reproducible results.

Moreover, as in all areas of pathology, diagnosis should never be made “in a vacuum”. Pertinent clinical data and communication between the pathologist and the clinician are extremely important in making a useful diagnosis.

FNA permits the accurate diagnosis of papillary, medullary and Anaplastic carcinomas of thyroid but is less useful in the diagnosis of follicular nodules, particularly the distinction between follicular adenomas and carcinoma.

And finally, as Dr. Oscar N. Rambo said in 1962 in his 'The limitations of histologic diagnosis': Pathologists are physicians and human beings. They have as great a capacity for error and susceptibility to subjective distractions as other practitioners of the art of medicine*.

Dr. Shilpa Prabhudesai MD, DNB
Consultant Pathologist.



MEDICAL ONCOLOGY PRESENT AND FUTURE

Medicine is a rapidly evolving branch of science and especially so is the field of oncology. Global incidence of cancer is steadily increasing and India accounts for about a sixth of the burden. The recent stress has been to study and understand the molecular genetics of cancer and delineate critical steps in the evolution of each tumor so that they can be made targets for screening, prevention, diagnosis and treatment.



Presently the most difficult aspect of cancer treatment is its unpredictability : unpredictable as to the nature of progression, recurrence and response to various treatment modalities. The next difficult aspect is the associated adverse effects of treatment, both short term and long term, which may be worse than the disease itself and life threatening too. Numerous strategies are being evolved to overcome these problems and the next few years will see a sea change in how cancer patients are treated.

Erythropoietin, G-CSF, Amifostine are a few drugs developed in the last few years to improve tolerability to cytotoxic chemotherapy and radiotherapy and improve patient compliance, survival and quality of life. Biphosphonates (Zoledronic Acid) has made palliation of bone metastases a much easier task. Long acting Somatostatin Analogs have made management of neuroendocrine tumours that much easier. They can control hypersecretion of hormones and symptoms related to it in gastroenteropancreatic system NETs. It may also exert anti-proliferative activity. Dexrazoxane helps in limiting cardiac muscle damage due to anthracyclines especially in the paediatric age group, where delayed cardiotoxicity is seen due to better long term survival.

Newer drug formulations, for example Pegylated Liposomal Doxorubicin have been developed with the same intent. Because Doxorubicin is encapsulated in a liposome it stays in circulation for longer time and it is less easily accessible to normal tissues but escapes more readily through the leaky vessels in the tumour tissue and concentrates there and exerts its action more locally. Another drug Cepacitabine needs to be converted to an active metabolite 5-fluorouracil by the enzyme Thymidine Synthetase. This enzyme is found in higher concentrations in tumour cells (3-20 fold) than in normal tissues and hence is converted to the active drug more in tumour tissue, thus limiting the side effects that were otherwise seen when 5-FU itself was used systemically. Novel drug delivery systems like using a biocompatible polymeric nanoparticle carrier for Paclitaxel instead of Cremaphor is under clinical trials. The advantages are that there is no risk of cremaphor related hypersensitivity reaction, needs no premedication and significantly less neutropenia inspite of escalated doses of paclitaxel.

Thalidomide, a drug which was banned for its teratogenic effects when used by pregnant women, has come back in a big way and is mainly used for its antiangiogenic properties. It is currently approved for use in Multiple Myeloma and is in clinical trials in renal cell carcinoma, hepatocellular carcinoma, MDS etc. Bortezomib, a proteasome inhibitor, which interrupts multiple signalling cascades within the cell and pushes the cell to apoptosis is being evaluated in relapsed and refractory myeloma.

The first success of molecular oncology studies has been targeting the tyrosine kinase over expressed by bcr-abl oncogene in CML patients. Imatinib has changed the way CML was being treated and given new hope for patients in accelerated phase and in blast transformation. Studies are underway to determine the duration of therapy, strategies to overcome resistance to imatinib and whether it can supplant bone marrow transplantation. The same drug also targets tyrosine kinase of c-kit oncogene expressed in Gastrointestinal Stromal Tumour. Without Imatinib, there was no effective treatment available for metastatic or recurrent GIST.

Monoclonal Antibodies targeted against specific antigens or receptors are being developed. They exert antineoplastic effects through ADCC, CDC, apoptosis, antiangiogenesis, inhibition of invasion and metastases, immunomodulation and also by delivering a radionuclide or immunotoxin. Since these monoclonal abs target specific sites which are expressed only in malignant cells or in a limited population on normal cells, the undesired effects are few. Rituximab (anti CD-20) is approved for use in B-cell lymphoma and Trastuzumab (anti her2-neu) for breast cancer and Bevacizumab (anti VEGF) for use in colorectal cancers. All these have shown significant improvement in response and survival in metastatic cancer with little adverse events and improved quality of life. Cetuximab (anti EGFR) in colon cancer and head & neck cancer and Alemtuzumab (anti CD52) in lymphoid malignancies are in clinical trials. Radioisotopes Y90 and I131 conjugated to anti CD20 Mab are also in clinical trials.

Geftinib, an oral drug, is another approach to target the EGFR to which it binds with high specificity and potency and thus inhibits downstream signalling and G1 cell cycle arrest and apoptosis. The drug shows promising activity in metastatic NSCLC, Squamous cell carcinoma of head & neck and hormone refractory prostate cancer.

Cancer vaccines is another exciting area of research and is a non toxic therapy for cancer. Similar to vaccines for infectious diseases, it is an active specific immunotherapy where the host immune system is activated de novo or is restimulated to mount an effective specific immune reaction against malignant cells. Several classes of cancer vaccines like whole tumor cell, tumor cell lysates, heat shock proteins, dendritic cell, peptide, anti idiotypic & viral antigens are being developed. Vaccines are being made for cervical cancer, nasopharyngeal cancer, melanoma, renal cell carcinoma, colorectal carcinoma and lymphomas. The best benefits of cancer vaccine is likely in the adjuvant setting when the immunosuppressive effects of bulky disease do not overwhelm the immune system.

Adoptive allogenic T-cell immunotherapy using donor lymphocyte infusions has improved remissions in relapsed CML patients post alloHSCT. It acts by inducing a graft Vs leukemia effect with limited GVHD. Preliminary data in patients with renal cell cancer and metastatic breast cancer also suggest that graft Vs tumor effects similar to GVL could be induced by DL1. More effective and selective GVL and GVT effects could be induced by specific immune donor lymphocytes. In the light of this, Stem Cell Transplantation required for induction of graft Vs host transplantation tolerance could be simplified by minimizing the conditioning to the degree of lymphoablation rather than myeloablation, aiming for engraftment of donor stem cells as step one followed by immunotherapy mediated by DLI as step two nonmyeloablative transplant.

Genomics, Proteomics and Pharmacogenomics are new tools for defining cancer management more precisely. DNA and protein microarrays may help in diagnosis of tumour entities (for e.g. in distinguishing ALL from AML and identify mixed lineage leukemias and in cancer of unknown origin), defining better prognostic markers and predicting treatment results in cancer drug therapy and hence in tailoring the therapy. It may help in selecting combinations of therapy which can simultaneously target different mechanisms of action to cause greater damage. It can help in detecting precisely the causes of drug resistance and offer means to overcome the same.

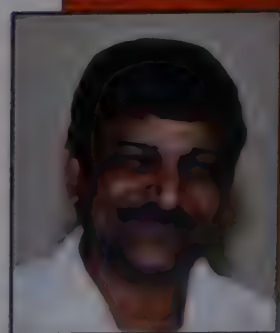
In spite of so many advances made for treating cancer patients more effectively and at the same time improving their quality of life, it would be more fruitful if the same efforts are made towards cancer prevention. It is well known that at least two-thirds of cancer is behaviour and life style related and about ten percent of them are hereditary in nature. Effective tobacco control, proper diet and nutrition and prevention of obesity, vaccination against appropriate infections and reduction of exposure to known carcinogens in the occupational and general environment and adequate study of hereditary cancers and effective strategies to screen population at risk and genetic counselling will all help in preventing the disease. In no other branch of medicine is the age old adage PREVENTION IS BETTER THAN CURE more appropriate.

Dr. Ravi B. Diwakar, MD, DM
HOD, Medical Oncology



TARGETED CHEMOTHERAPY

Biological research, particularly development of molecular biology over the past 20 years has improved the understanding of the pathophysiology of cancer diseases. Increasing understanding of regulatory pathways of immune system and in turn understanding the mechanisms of action of various emerging biotherapies.



Cancer is a byproduct of alterations in DNA and gene transcriptions or translations. Strategies of biotherapy revolve around these basic molecular and cell functions.

Conventional therapeutic modalities like chemotherapy, radiotherapy work within the cell microenvironment disrupting DNA, RNA and protein synthesis, so that the cell becomes apoptotic and dies.

To increase tumor sensitivities, emerging therapies like tyrosinekinase inhibitors and immuno therapies have been developed. Immuno therapy manipulates or augments immune cells, it includes lymphokine activated T cells, cytokines, monoclonal antibodies and vaccines.

Science is studying the capability of altering external and internal cellular responses to inhibit cancer, cell growth, improving immune surveillance toward cancer cells, disrupting the metastatic process, interfering with the pathways by which normal cells transform into cancer cells, altering cancer cells behaviour so that they function like healthy cells. This research provides the foundation of emerging targeted therapies.

One prominent characteristic found in malignant cells is self sufficiency in growth signals. Growth factors of interest in cancer development are transforming growth factor - B, platelet - derived growth factor, Vascular Endothelial Growth Factor (VEGF) and Epidermal Growth Factor (EGF). Other characteristics of malignant cells include evasion of apoptosis, sustained angiogenesis, unlimited replicative potential and capacity to invade and metastasise, thus interrupting or blocking each or any of these unique malignant characters is the strategy of new anticancer therapy.

The understanding of the different domains is the key to unlocking the mystery of carcinogenesis and role of targeted therapy:

The first domain is, extra-cellular ligand binding region is the site of targeted monoclonal antibody binding. Once bound the antibody is internalized and prevents signaling to the nucleus (antiproliferation, promotes apoptosis, anti angiogenesis, anti metastasis and cell cycle arrest). The second domain, intracellular protein tyrosine is the targetted site of small molecule therapy such as selected tyrosin kinase inhibitors which inhibits phosphorylation and prevents messages from reaching the cell nucleus. The third domain is the intra nuclear cell cycle area where DNA, RNA and genetic material reside. Cell cycle functions are also being targetted as domains with novel strategies such as genetherapy and antisense therapy.

Types of Targetted therapies :

- a) Monoclonal Antibodies
- b) Molecular signaling pathways (Tyrosin kinase and farnesyl transferase)
- c) Antiangiogenesis
- d) Vaccines
- e) Genetherapy.

Clinical development of targeted therapy :

The concept of drug specific targeting agents have evolved over past 20 years. In 1986 large scale monoclonal antibodies was made possible by Kohler and Milsteri through publication of hybridoma methodology (Dillman 2001)

Monoclonal Antibodies are classified and named based on their derivation :

- a) Murine Monoclonal antibodies
- b) Chimeric Antibodies
- c) Humanised monoclonal antibodies
- d) Human monoclonal antibodies.

- A) Murine Monoclonal antibodies have 100% mouse gene sequence; Murine "momab" is suffix. The antibodies are effective in searching for and locating the target antigen and forming an antigen and antibody complex. 'HAMA' response is high.
- B) Chimeric antibodies are human-mouse antibody mixture, chimera 'Ximab' is suffix. They have 95% human gene sequence and have prolonged half life. They induce both complement and effector mediated cell tumor lysis and they uncommonly produce human antichimeric response (HACA).
- C) Humanised Monoclonal antibodies are suffixed 'Zumab' and have 95% to 98% human gene sequence. They induce both complement and effector mediated cell tumor lysis, but rarely produce human anti-human response (HAHA)
- D) Human monoclonal antibodies posses the suffix ending "Umab". They have 100% human gene sequence and have lower antigenicity. They have prolonged half life and induce both complement and effector mediated cell tumor lysis.

Monoclonal antibody therapy is based on the ability to target marker and bind to cell membrane antigens with great specificity. The MoAb utilize tumor immunology and components of the host natural defence mechanisms to exert their desired effects.

Conjugated monoclonal antibodies can be used as carriers of toxic therapy, such as radio-nucleide (Zevalin), cytotoxic drugs, cell toxins to specific cell targets. They are also employed to create tumour vaccines by stimulating a host antibody reaction causing the products of anti-idiotypic antibodies.

In the last two to five years selected monoclonal antibodies have become a standard of care for certain malignancies.

Rituximab, a chimera monoclonal antibody used against CD20 - positive B cell Non Hodgkin Lymphoma is now utilized in combination with standard of care chemotherapy regime (CHOP).

Trastuzumab, a humanized monoclonal antibody is a weekly maintenance therapy for HER2 neupositive metastatic breast cancer patients.

Toxicity of monoclonal antibodies :

The common toxicity of monoclonal antibodies that react with antigen is the potential to produce a side effect referred to as an 'INFUSION - RELATED SYMPTOM COMPLEX'. This is seen with an increasing tumor burden and with first or second dose of monoclonal antibody. The 'infusion - related symptom complex' is characterized by fever, chills, rigor, headache, bronchospasm, throat tightness, hypotension, nausea, rash, flushing and urticaria. The reaction may be mild to severe and rarely fatal. Patients are treated with antihistamine, steroids, H2 blockers and epinephrine. The dose may be restarted again with slower rate.

Further understanding of the tumor biology will lead to formulation of more and more targetted agents which will inturn improve the results of cancer treatment with minimal toxicity.

Dr. Shekhar Patil, MD, DM
Director & Consultant Medical Oncologist



NUCLEAR MEDICINE AT BIO

Nuclear medicine today is a fast growing field which offers procedures which are essential in medical specialities from Pediatrics to Cardiology to Oncology. We at the Bangalore Institute of Oncology have state of the art technology to help us keep pace with the new & innovative treatment that target and pinpoint molecular levels within the body.



Nuclear Medicine imaging is unique, as it provides doctors with information about both structure and function of the different organs in the body. Nuclear medicine specialists use safe, painless and cost effective technique to image body and treat disease. It is a way to gather medical information that would otherwise be unavailable, require surgery, or necessitate more expensive diagnostic tests. Nuclear medicine imaging procedure often identify abnormalities very early in the progress of a disease - long before many medical problems are apparent with other diagnostic tests.

Nuclear Medicine uses very small amounts of radioactive materials to diagnose & treat disease. In imaging the radioactive materials are detected by special types of cameras that work with computers [Gamma Cameras] to provide very precise pictures about the area of the body being imaged. In treatment, the radioactive materials go directly to the organ being treated. The amount of radiation in a routine Nuclear imaging procedure is comparable with that received during a diagnostic X-ray, & amount received in a typical treatment procedure is kept within normal limits.

Some of the Nuclear Medicine procedures routinely done at the Bangalore Institute of Oncology include

- Evaluation of function of thyroid gland/nodule
- I-131 treatment for thyrotoxicosis and post operative ca. thyroid management.
- Evaluation of skeletal metastasis / infection /stress fracture/ metabolic bone disease.
- Evaluation of pulmonary embolism
- Evaluation for renal function / obstructive uropathy
- Testicular scan in torsion testis.
- Evaluation for haemangiomas / acute cholecystitis /biliary atresia/ liver transplant.
- Identification of bleed site
- Myocardial perfusion studies
- Evaluation for neoplasia like lymphomas/lung cancer/ hepatomas /melanoma.
- Others like Lymphoscintigraphy/Dacroscintigraphy/Bone marrow imaging/CSF leak evaluation/
Brain perfusion scan/Tumor viability study/Mammoscintigraphy.

Dr. K.G. Kallur, MD, DRM
HOD, Nuclear Medicine

REACHING OUT TO PEOPLE

Bangalore Institute of Oncology is not just another private hospital catering to the rich, but it is an Oncology Institute with a human touch. Nowhere is this more evident than in the regular free cancer detection camps conducted by the hospital in and around Karnataka.



As early as 1989, BIO realized that the main reason for the patients, especially from rural areas to delay treatment for cancer was ignorance and poverty. The free cancer detection camps combined with Continued Medical Education Programmes and lectures on cancer detection, cure and control were aimed at overcoming these barriers.

A team of BIO Oncologists, Physicians, Dentists, Lady Doctors, Specialists in alternate medicine along with dedicated staff, visit the rural areas in Karnataka, and neighbouring Tamil Nadu and Andhra Pradesh, conduct cancer detection camps, thus bringing medicine to the people's door step.

Preliminary screening of patients is done at these camps and any patient who may require further evaluation and treatment are asked to visit BIO where the camp patients are treated at concessional rates.

Beginning from 1989 BIO has conducted about 170 camps with screening of about a 1,00,000 patients out of which 5,000 patients have been detected to have cancer.

The cancer detection bus sponsored by Rotary, which has facilities for mobile X-Ray and other minor screening procedures, is an added advantage.

'Prevention is better than cure' is an oft repeated adage but BIO has put it into practice, by not only conducting Cancer Awareness Programmes across the state but also by running free preventive oncology clinic in the hospital premises every Saturday. People from in and around Bangalore are educated and counselled regarding cancer detection and treatment. They can undergo various screening procedures and avail the opportunity of free consultation with the reputed oncologists of BIO.

The journey from the 30 bedded hospital, started in 1989, to the 110 bedded corporate oncology institute, with state of the art machinery, has been a long one and would not have been possible without the support of the people of Karnataka and Bangalore in particular.

Entering into the 15th year of its existence, BIO is looking forward to play a more responsible social role towards increasing cancer awareness in the society. The free CDC and preventive oncology clinics have been just the initial steps taken in this direction :

- Ø To dispel the myths and misconceptions regarding cancer
 - Ø To educate people regarding the spread of cancer
 - Ø To emphasise the need for early detection and treatment
 - Ø To provide free treatment to the poor irrespective of caste, creed or religion
 - Ø To see that no patient is denied treatment due to financial constraints
- is the future that is envisaged and that it can become a reality with the continued support and good will of the people.

Dr. Arundhathi Chandrasekhar, MBBS, KAS, DHA, CFN, (MBA)
Head Medical Services

MY EXPERIENCE AT THE LINAC CENTER



I am a housewife (57 years), who had the recent experience of undergoing 30 sessions of radiation therapy at Bangalore Institute of Oncology.

I have been fully satisfied with the treatment and more importantly the atmosphere at BIO as it made a lot of difference to my mental state of mind, which in turn greatly helped me to go through the treatment with a positive mind and without any interruptions. The comfortable and well laid out ambience of the reception hall with TV and comfortable seating arrangement and smiling reception staff (Ms. Rama & Padma along with other sisters) made it much easier for patients like me to go through this difficult phase of the treatment. We could also make a number of good friends, which in turn also helped create a sort of support group and right atmosphere.

We found to our relief that Doctors Ramesh, Gopinath, Girish Rao, Srinivas, and their staff were always available whenever required and so it greatly helped us to successfully face certain sudden unexpected developments.

The other feature, which I liked and appreciated is the arrangement of the car valet service, which removed all the tensions of parking in the narrow lane, which otherwise seemed like a big job on the first day of our visit to the radiation centre. The hospital and the radiation staff in general are very helpful, co-operative and responsive to the different needs and sensitivities of the patients.

Vishakha N Acharya

ನನ್ನದೊಂದು ಅನುಭವ

ಕೆಲ ತಿಂಗಳುಗಳಿಂದ ನನ್ನ ದಿನ ಕರ್ಕಶವಾಗುತ್ತಾ, ಕ್ರಮೇಣ ಕುಗ್ಗುತ್ತಾ ಬಂದಾಗ ಮೊದಮೊದಲು ನಿರ್ಲಕ್ಷಿಸಿದೆ, ಮಕ್ಕಳ ಬಲವಂತಕ್ಕೆ ವೈದ್ಯರ ಬಳಿಗೆ ಹೋದಾಗ ಅವರು ಔಷಧಿಕೊಟ್ಟರೂ ಗುಣ ಕಾಣಲಿಲ್ಲ, ನಂತರ ಅನುಮಾನ ಬಂದು ತಜ್ಞ ವೈದ್ಯರ ಬಳಿಗೆ ಹೋಗಲೇ ಬೇಕಾಯಿತು. ಅವರು ವಿಧವಿಧವಾದ ಪರೀಕ್ಷೆಗಳನ್ನು ಮಾಡಿ ಕೊನೆಗೆ ನನ್ನ ಗಂಟಲಿನಲ್ಲಿರುವ ಗಡ್ಡೆ ಕ್ಯಾನ್ಸರಿನ ಲಕ್ಷಣಗಳನ್ನು ಹೊಂದಿದೆ, ಎಂದಾಗ ನಮ್ಮ ಮನೆಯ ಜನರ ತಲೆಯ ಮೇಲೆ ಸಿಡಿಲೆರಿಗಿದಂತಾಗಿದ್ದು ನಿಜ.

ಈ ಬೆಂಗಳೂರಿನಲ್ಲಿ ಆಸ್ಪತ್ರೆಗಳಿಗಾಗಲೀ, ವೈದ್ಯರಿಗಾಗಲೀ ಕೊರತೆ ಇಲ್ಲ. ಆದರೆ ನಮ್ಮ ಹಿತೈಷಿಗಳು ಬಿ.ಐ.ಒ. ಉತ್ತಮ ಚಿಕಿತ್ಸೆ ನೀಡುತ್ತದೆ ಎಂದಾಗ ನಾನು ಅಲ್ಲಿಯೇ ಚಿಕಿತ್ಸೆ ಪಡೆಯಲು ನಿರ್ಧರಿಸಿದೆ.

ನಾನು ಚಿಕ್ಕಂದಿನಿಂದಲೂ ಹೆಚ್ಚಿಗೆ ಆಸ್ಪತ್ರೆಗೆ ಓಡಾಡಿದವಳಲ್ಲ. ದೇವರ ಅನುಗ್ರಹದಿಂದ ನಮ್ಮ ಕುಟುಂಬದವರಾರೂ ಧೀರ್ಘಕಾಲದ ರೋಗಿಗಳಾಗಿ, ಆಸ್ಪತ್ರೆಯಲ್ಲಿದ್ದು ಧೀರ್ಘ ಚಿಕಿತ್ಸೆ ಪಡೆಯುವಂತಹ ಅನಾರೋಗ್ಯದಿಂದ ಬಳಲಿರಲಿಲ್ಲ. ಹೀಗಾಗಿ ಆಸ್ಪತ್ರೆ ಎಂದರೆ ಆದಷ್ಟು ಅದರಿಂದ ದೂರವಿರಬೇಕೆಂಬ ಭಾವನೆ ನಮ್ಮಲ್ಲಿತ್ತು. ಈಗ ಇಂತಹ ದುರ್ಬರ ಪರಿಸ್ಥಿತಿ ಬಂದುದಕ್ಕೆ ಎಲ್ಲರ ಮೊಗದಲ್ಲೂ ಕಳವಳ ಚಿಂತೆ, ನನ್ನಲ್ಲಿಯೂ ಆತಂಕ ಮತ್ತು ಕಳವಳ ಮೂಡಿತು.

ಹೌದು, ಈಗ ನಾನು ಧೈರ್ಯ ತೆಗೆದುಕೊಳ್ಳದಿದ್ದರೆ ಅಗುವುದಿಲ್ಲ ಎನಿಸಿ ಚಿಕಿತ್ಸೆಗೆ ಸಿದ್ಧಳಾದೆ. ಬಿ.ಐ.ಒ ನಲ್ಲಿ ರೇಡಿಯೇಷನ್ ಚಿಕಿತ್ಸೆ ಅರಂಭವಾಯಿತು, ಅಲ್ಲಿಗೆ ಬರುತ್ತಿದ್ದ ಎಲ್ಲ ವಯಸ್ಸಿನ, ಎಲ್ಲ ವರ್ಗದ ರೋಗಿಗಳನ್ನು ಕಂಡಾಗ ನನಗೆ ಅವರ ಬಗ್ಗೆ ತುಂಬಾ ಅನುಕಂಪ ಉಂಟಾಯಿತು ಆದರೆ ಅವರ ಮೊಗದಲ್ಲಿದ್ದ ಆಶಾಭಾವನೆ, ಗುಣಮುಖರಾಗುತ್ತಿದ್ದೇವೆಂಬ ನಂಬಿಕೆ, ರೋಗದಿಂದ ಪಾರಾಗುವ ಭಲ ಕಂಡಾಗ ನನಗೆ ಸಮಾಧಾನವಾಯಿತು.

ಬಿ. ಐ. ಒ. ಆಸ್ಪತ್ರೆಯಲ್ಲಿ ಇರುವ ಸಿಬ್ಬಂದಿಯ ಶಿಸ್ತು, ಸಮಯಪಾಲನೆ, ಎಚ್ಚರಿಕೆ, ರೋಗಿಗಳ ಬಗ್ಗೆ ಇರುವ ಸಹಾನುಭೂತಿ ಬಾಕಿಯಾವ ಆಸ್ಪತ್ರೆಯಲ್ಲೂ ನಾನು ನೋಡಿಲ್ಲ. ವಾರದಲ್ಲಿ ಶನಿವಾರ, ಭಾನುವಾರ, ಬಿಟ್ಟರೆ ಉಳಿದ ಐದು ದಿನಗಳೂ ತಪ್ಪದೇ ನಾನು ರೇಡಿಯೇಷನ್ ಗೆ ಹೋಗುತ್ತಿದ್ದೆ. ಅದರ ಅಂಗವಾಗಿ ಕಿಮೋಥೆರಫಿಯನ್ನು ತೆಗೆದುಕೊಳ್ಳಬೇಕಾಯಿತು. ಆಗಾಗ ರಕ್ತ ಪರೀಕ್ಷೆ, ಉಳಿದ ಪರೀಕ್ಷೆಗಳನ್ನು ತಪ್ಪದೇ ನಡೆಸಲಾಗುತ್ತಿತ್ತು. ಈ ಎಲ್ಲ ವೈದ್ಯಕೀಯ ಪ್ರಕ್ರಿಯೆಗಳಿಗೆ ವಿವಿಧ ವಿಭಾಗಗಳಿದ್ದವು. ಜೊತೆಗೆ ಹಣಕಾಸಿನ ಲೆಕ್ಕ ಪತ್ರದ ಹೊಣೆ ಹೊತ್ತ ವಿಭಾಗ. ಈ ಎಲ್ಲ ವಿಭಾಗದಲ್ಲಿದ್ದ ವೈದ್ಯರು, ತಜ್ಞರು, ಅಯಾ ವಿಭಾಗದ ಮುಖ್ಯಸ್ಥರು ವೈದ್ಯಕೀಯ ಎಲೆಕ್ಟ್ರಾನಿಕ್ ಪರಿಕರಗಳ ಜವಾಬ್ದಾರಿ ಹೊತ್ತ ಸಿಬ್ಬಂದಿ, ರಕ್ತ ಪರೀಕ್ಷೆಯಿಂದ ಹಿಡಿದು ಎಲ್ಲಾ ಹಂತಗಳಿಗೆ ಬೇಕಾಗುವ ವಿವಿಧ ರೀತಿಯ ಚಿಕಿತ್ಸಾವಿಭಾಗದಲ್ಲಿನ ಸಹಾಯಕ ವೈದ್ಯರು, ಪರಿವೀಕ್ಷಕರು, ದಾದಿಗಳು ಮತ್ತು ಇತರ ಸಿಬ್ಬಂದಿ ಈ ಎಲ್ಲ ಜನರ ಪರಿಚಯ ನನಗಾಗತೊಡಗಿತು. ಮೊದಲಿಗೆ ಆಸ್ಪತ್ರೆಯ ಬಗ್ಗೆ ನನಗಿದ್ದ ಜಿಗುಪ್ಸೆ, ಅಂಜಿಕೆ ಮತ್ತು ಅನುಮಾನ ಎಲ್ಲ ಚಿಕಿತ್ಸೆ ಆರಂಭಿಸಿದ ಕೆಲ ದಿನಗಳಲ್ಲಿಯೇ ಮಾಯವಾಗಿತ್ತು, ನಾನು ಆವರ ಪೈಕಿ ಒಬ್ಬಳಂತೆ ಅನಿಸಿ ದಿನಾಗಲೂ ರೇಡಿಯೇಷನ್ ಗೆ ಹೋಗಿ ಬರುತ್ತಿದ್ದೆ.

ನಾನು ಹಲವಾರು ಪ್ರಾಂತ್ಯಗಳನ್ನು ಸುತ್ತಿದ್ದೇನೆ, ಮುಂಬಯಿ, ಕಲ್ಕತ್ತ, ದೆಹಲಿ, ಹೈದರಾಬಾದ್, ಚೆನ್ನೈ ಮುಂತಾದ ನಗರಗಳಲ್ಲಿ ವಾಸಮಾಡಿದ್ದೇನೆ. ಅಲ್ಲಿ ಸಿಗದಿರುವ ಉತ್ತಮ ಚಿಕಿತ್ಸೆ ಮತ್ತು ತಪಾಸಣೆ ಇಲ್ಲಿ ದೊರಕುತ್ತದೆ ಎಂದು ನನಗೆ ಅನಿಸಿದೆ. ಈಗಿನ ಕಾಲದಲ್ಲಿ ಸರ್ಕಾರಿ ಆಸ್ಪತ್ರೆಗಳಂತೂ ರೋಗಿಗಳ ಅಂತ್ಯಕಾಲದ ತಾಣಗಳಾಗಿ ಪರಿವರ್ತನೆಗೊಂಡಿದೆ. ಇಂತಹ ಪರಿಸ್ಥಿತಿಯಲ್ಲಿ ಒಂದು ಚಿಕಿತ್ಸಾಲಯ ಕೇವಲ ಹದಿನೈದು ವರುಷಗಳಲ್ಲೇ ಇಷ್ಟೊಂದು ಪ್ರಗತಿ ಸಾಧಿಸಿದೆ ಎಂಬುದನ್ನು ನೋಡಿದಾಗ ತುಂಬಾ ಅಚ್ಚರಿಯಾಗುತ್ತದೆ.

1989ರಲ್ಲಿ ಅರಂಭಗೊಂಡು ಮೊದಲಿಗೆ ಕೇವಲ ನಾಲ್ಕೈದು ತಜ್ಞ ವೈದ್ಯರ ಹಾಗೂ ಮೂವತ್ತು ರೋಗಿಗಳಿರುವುದಕ್ಕೆ ಮಾತ್ರ ವ್ಯವಸ್ಥೆ ಇದ್ದ ಬಿ.ಐ.ಒ.ನಲ್ಲಿ ಇಷ್ಟು ಕಡಿಮೆ ಅವಧಿಯಲ್ಲಿ ನೂರಾರು ರೋಗಿಗಳಿರುವುದಕ್ಕೆ ವ್ಯವಸ್ಥೆ ಮಾಡಲಾಗಿದ್ದು, 60 ಜನ ತಜ್ಞ ವೈದ್ಯರ ತಂಡ ಚಿಕಿತ್ಸಾ ಕಾರ್ಯದಲ್ಲಿ ತೊಡಗಿ 200ಕ್ಕಿಂತಲೂ ಹೆಚ್ಚಿನ ಸಂಖ್ಯೆಯಲ್ಲಿ ಹೊರರೋಗಿಗಳನ್ನು ದಿನಾಗಲೂ ನೋಡಲಾಗುತ್ತದೆ. ಇಲ್ಲಿಯ ನೂರು ಜನಕ್ಕಿಂತ ಹೆಚ್ಚಿನ ದಾದಿಗಳು, ಪರಿವೀಕ್ಷಕರು, ಸ್ವಾಗತಮಾಡುವ ಸಿಬ್ಬಂದಿಗಳು, ತಂತ್ರಜ್ಞರು, ರೆಡಿಯೇಷನ್ ವಿಭಾಗದವರು, ಲೆಕ್ಕ ಪತ್ರ ವಿಭಾಗ, ಇತರ ವಿಭಾಗದವರು ಉತ್ತಮ ಕಾರ್ಯ ನಿರ್ವಾಹಕರಾಗಿ, ಅಚ್ಚುಕಟ್ಟಾಗಿ ಮೊದಲೆ ನೊಂದಿರುವ ರೋಗಿಗಳಿಗೆ ಹಿತವಾಗುವಂತೆ, ಸಹಾನುಭೂತಿಯಿಂದ ಬಹಳ ಶಿಸ್ತಿನಿಂದ ತಮ್ಮ ಕರ್ತವ್ಯ ನಿರ್ವಹಿಸುತ್ತಿರುವ ಪರಿಯನ್ನು ನೋಡಿದಾಗ ಯಾರಿಗಾದರೂ ಆಶ್ಚರ್ಯವಾಗುವುದು. ಈ ವೈದ್ಯಕೀಯ ಸಂಸ್ಥೆ ಇನ್ನೂ ಹೆಚ್ಚಿನ ಸೇವೆಯಲ್ಲಿ ತನ್ನನ್ನು ತೊಡಗಿಸಿಕೊಂಡು ವ್ಯಾಧಿಗ್ರಸ್ತರ ಪಾಲನೆ ಧನ್ಯತೆಯಾಗಿ ಕೀರ್ತಿ ಪಡೆಯಲೆಂದು ಹಾರೈಸುತ್ತೇನೆ.

ಡಾ|| ನಿರುಪಮಾ



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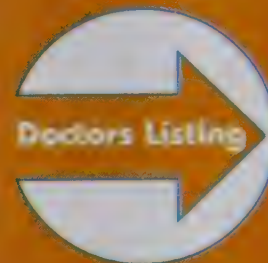
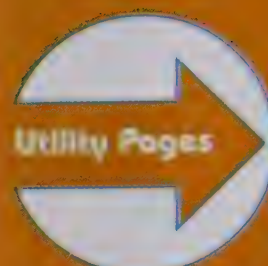




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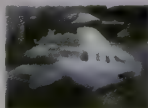
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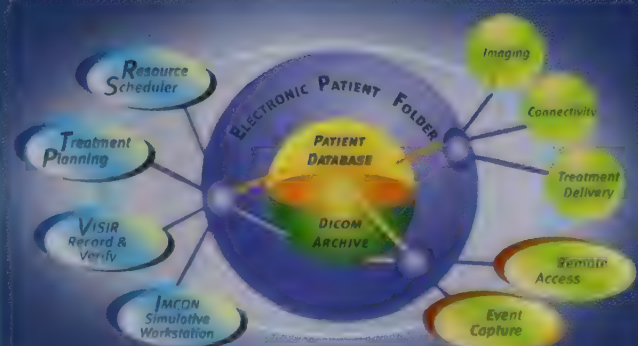
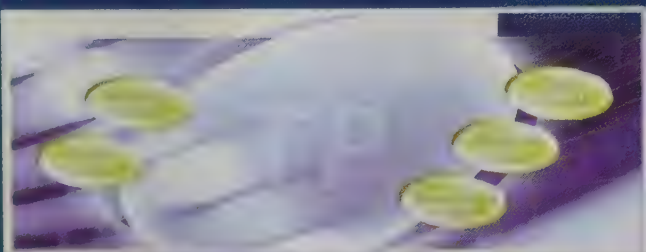


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